Surface treatment of titanium or titanium base alloy

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SURFACE TREATMENT OF TITANIUM OR TITANIUM BASE ALLOY

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5 Claims. (Cl. 204—29)

The present invention relates to improvements in or relating to the surface treatment of titanium or titanium base alloy articles for the purpose of preparing a suitably conditioned surface thereon prior to, for example, electroplating.

In British patent specification No. 758,013 there is described and claimed inter alia a method of surface treatment of titanium or titanium base alloy articles which comprises treatment of the surface of the said articles with concentrated hydrochloric acid solution at elevated temperatures followed by electrodeposition of a coating of metal thereon.

Said temperature may be 90–100° C. and the article may be pretreated with a standard pickling and de-scaling bath before treatment with the hydrochloric acid.

It has now been found that by treating the surfaces of titanium or titanium base alloy articles with hydrogen at elevated temperatures surfaces are formed which have a substantially similar etched appearance to that produced according to the method described and claimed in British patent specification No. 758,013, that is to say surfaces which are porous, grey and matt in appearance. It has also been found that the surfaces thus formed likewise permit deposition thereon of a satisfactorily adherent coating of metal.

According to the present invention the method of surface treatment of titanium or titanium base alloy articles comprises treatment of the surface of the said articles with hydrogen at elevated temperatures, preferably at a temperature between 600° and 1000° C., followed by deposition of a coating of a metal thereon, for example platinum, rhodium or iridium or an alloy of two or more of these metals.

It is sometimes desirable to pretreat the articles with a pickling or de-scaling bath before treating them with hydrogen.

By way of example, by passing hydrogen over 16 pieces of titanium 1½ in. x ¾ in. x 16 S.W.G. (0.064 in.) at a temperature between 600 and 1000° C. for various periods of time a series of 16 surface treated titanium specimens

is prepared containing hydrogen over a range of 9–95 mg. and it is found that a satisfactory adherent electrodeposit of platinum can be formed on each piece thus treated. A suitable plating procedure comprises plating at a current density of about 0.8 amp./sq. dm. from an aqueous solution of sodium hexahydroxy platinate containing 0.5 to 1% sodium hydroxide. A complete disclosure of suitable plating procedures and baths may be found in "Metal Industry," vol. 85 (November 19, 1954), pages 427–429.

The process of the present invention permits surfaces of titanium or titanium base alloy articles to be conditioned quickly, without loss of titanium, and uniformly even in the presence of stresses and welds.

What we claim is:

1. A method of surface treatment of an article selected from the group consisting of titanium and titanium base alloy articles which comprises treating the surface of the said articles with hydrogen at elevated temperatures and then depositing a coating of a metal thereon.

2. A method as claimed in claim 1 wherein the elevated temperature is between 600° and 1000° C.

3. A method as claimed in claim 1 wherein the article is pretreated with a pickling bath before treating it with hydrogen.

4. A method as claimed in claim 1 wherein the aforesaid metal is a metal selected from the group consisting of platinum, rhodium and iridium and alloys of at least two of these metals.

5. A method as claimed in claim 1 wherein the article is pretreated with a de-scaling bath before treating it with hydrogen.

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